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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,952	11/14/2003	Abiola Awujoola	02-6433	6935
24319	7590	11/12/2004	EXAMINER	
LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			NGUYEN, JOSEPH H	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/713,952

Applicant(s)

AWUJoola ET AL.

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7, 9-17, 19-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Shim et al or Mathews et al.

With respect to Shim et al.

Regarding claim 1, Shim et al discloses on figures 2 (and figure 1 hereby used for referenced numerals) an apparatus for packaging an integrated circuit comprising a substrate 12 comprising a grounding path 44; an integrated circuit die 10 attached to the top surface of the substrate; a plurality of die connections 34 connecting the integrated circuit to the substrate; and a package shell 14 attached to the top surface of the substrate and electrically connected to the grounding path 44, the package shell configured to cover and electro-magnetically shield the integrated circuit die 10 and the plurality of die connections 34.

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Regarding claim 2, Shim et al discloses on figures 2 the package shell is filled with a thermally conductive filler 36 configured to thermally couple the integrated circuit die 10 to the package shell 14.

Regarding claim 3, Shim et al discloses on figures 2 the die connections 34 are wire bond connections.

Regarding claim 4, Shim et al discloses on figures 2 the package shell 14 is a thermally conductive heat spreader.

Regarding claim 5, Shim et al discloses on figures 2 the package shell is bonded to the substrate with an electrically conductive adhesive 46.

Regarding claim 7, Shim et al discloses on figures 2 the package shell comprise at least port configured to facilitate filling the package shell with a thermally conductive filler 36.

Regarding claim 9, Shim et al discloses on figures 2 further a package frame 36 configured to laterally surround the package shell 14.

Regarding claim 10 Shim et al discloses on figures 2 the package frame is molded over a brim of the package shell.

Regarding claim 11, Shim et al discloses on figures 2 the substrate is configured to electrically connect a plurality of bonding pads 26 on the top surface of the substrate with an array of connecting pads 22 on a bottom surface of the substrate.

Regarding claim 12, Shim et al discloses on figures 2 further an array of solder balls 28 attached to the connecting pads 22.

Regarding claim 13, Shim et al discloses on figures 2 the substrate is a printed circuit board.

Regarding claims 14-17, 19-23, Shim et al discloses on figures 2 all the steps of the method and all the structures set forth in the claimed invention.

With respect to Mathews et al.

Regarding claims 1-5, 7, 9-17, 19-23, Mathews et al discloses on figure 6 all the structures and steps of the method set forth in the claimed invention.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shim et al as or Mathews et al applied to claims 1 and 14 above, and further in view of Marrs.

Regarding claims 6 and 18, Shim et al or Mathews et al discloses substantially all the structures set forth in the claimed invention except the electrically conductive adhesive being a silver filled epoxy. However, Marrs discloses that the electrically conductive adhesive being a silver filled epoxy (col. 6, lines 5-9). In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shim et al or Mathews et al by having the electrically

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conductive adhesive being a silver filled epoxy for the purpose of effectively packaging a semiconductor integrated circuit device.

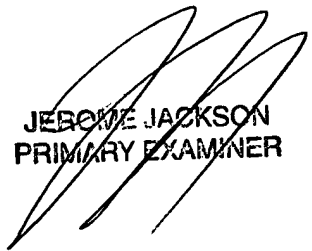
Regarding claim 8, Shim et al or Mathews et al discloses substantially all the structures set forth in the claimed invention except the package shell comprising at least vent. However, Marrs discloses on figure 1A the package shell 108 comprising at least vent 116a. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shim et al or Mathews et al by having the package shell comprising at least vent for the purpose of effectively transferring heat away from the die to the exterior of the packaged integrated circuit as taught by Marrs (col. 5, lines 24-29).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications.

JN

November 10, 2004.



**JEROME JACKSON  
PRIMARY EXAMINER**